

4. Description of two new Species of Slugs of the Genus *Parmarion* from Borneo. By WALTER E. COLLINGE, F.Z.S., Assistant Lecturer and Demonstrator in Zoology and Comparative Anatomy, Mason College, Birmingham.

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(Plate XLIV.)

The two new species of *Parmarion* here described were collected by Mr. A. H. Everett at Lombok, Borneo, and forwarded to Mr. Edgar A. Smith, of the British Museum, who has very kindly placed the same in my hands for identification.

The perfect specimens and dissected parts have been placed in the collection of the British Museum, South Kensington.

In 1895 I described, in conjunction with Lieut.-Col. H. H. Godwin-Austen, F.R.S.<sup>1</sup>, a series of forms from Borneo allied to those now received, and I am very pleased to be able to examine further material from this interesting region.

In the above-mentioned paper we expressed the hope that further material would be obtained from Borneo, in order that our knowledge of the genera *Parmarion*, *Microparmarion*, *Damuyantia*, &c., might be increased. One of the species here described, *P. intermedium*, may, I think, be regarded as a connecting link between the genus *Parmarion* and *Microparmarion*.

PARMARION EVERETTI, n. sp.

*Hab.* Lombok (2000 ft.), Borneo (A. H. Everett).

*Shell* oval in form, almost flat, amber-coloured; lines of growth well marked, apex obscure, borders membranaceous, hidden by the mantle.

Major diam. 16 millim.; minor diam. 12 millim.

*Animal* (Pl. XLIV. fig. 1) greenish grey, head dark green with light brown portion in mid-dorsal line; sides of head yellow. Mantle-lobes yellowish brown, with fine dark blue speckles and blotches. Commencing beneath the visceral mass, where the dorsum is flat and very pale yellow in colour, are two dark brown bands, shading posteriorly to black, which pass backwards and slightly downwards, terminating at each side of the caudal mucous pore; posteriorly the sides of the body are speckled with black. Rugæ not prominent. Foot-fringe yellow, with somewhat broad chocolate-coloured lineoles, narrowing and becoming lighter in the anterior region. Foot-sole divided into median and lateral planes, the former yellow in colour, the latter greenish grey. Caudal mucous pore a vertical slit, not extending to the foot-sole (Pl. XLIV. fig. 2).

Length (in alcohol) 42 millim.

I have much pleasure in associating with this species the name of Mr. A. H. Everett.

<sup>1</sup> "On the Structure and Affinities of some new Species of Mollusca from Borneo," Proc. Zool. Soc. 1895, pp. 241-250, pls. xi.-xiv.

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The vagina is a thick-walled tube slightly constricted in its upper portion; from the lower portion the receptacular duct arises, as a narrow, somewhat long tube, enlarging into a globose receptaculum seminis; in the example examined this was empty and presented the large leaf-like appearance shown in the figure (Pl. XLIV. fig. 3 *r.s.*). The penis is short and constricted in its lower half, its upper portion being bead-like (Pl. XLIV. fig. 3 *p.*), a feature common to a large number of species, the vas deferens passes off from the inner side (left-hand side) of the penis. The retractor muscle has its attachment immediately above the commencement of the vas deferens. The common duct formed by the oviducal and prostatic canals is thrown into a series of closely wound folds. The albumen-gland is somewhat ovoid in form. The hermaphrodite gland is a small oval-shaped body, attached to the thin convoluted tube, the hermaphrodite duct. The dart-sac is a comparatively short, wide tube, folded upon itself at its upper portion; unfortunately no dart was present.

*Affinities.*

The nearest species, as regards the internal anatomy, to this species is the *P. martensi*, Simr., in which species (*cf.* Pl. XLIV. fig. 4, reproduced from Simroth's original figure<sup>1</sup>) we have the elongated form of the receptaculum seminis and a similar shaped penis. *P. everetti* differs however from *P. martensi* in the altogether different shaped dart-sac; in the latter species this organ is constricted in its middle, the upper half being bent upon itself. Externally the two species are quite unlike.

## PARMARION INTERMEDIUM, n. sp.

*Hab.* Lombok (1500 ft.), Borneo (*A. H. Everett*).

*Shell* oval in form, convex, membranaceous borders larger than in *P. everetti*, and covered by the mantle, amber-coloured; lines of growth well marked, apex obscure.

Major diam. 18.5 millim.; minor diam. 12.5 millim.

*Animal* (Pl. XLIV. figs. 5 & 6) very dark green, almost black, lighter beneath the mantle; sides of the body greenish brown; posterior region of the body very dark green, almost black, becoming lighter anteriorly. Mantle-lobes black. Rugæ not very prominent, elongated in the posterior region. Foot-fringe nearly black, with fine yellow lineoles. Foot-sole divided into median and lateral planes, the former yellow in colour, the latter almost black. Caudal mucous pore a deep vertical slit, not extending to the foot-sole, the sides of the pore are white (Pl. XLIV. fig. 7).

Length (in alcohol) 43 millim.

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The vestibule commences as a wide pouch-like cavity, from

<sup>1</sup> Zool. Ergebnisse einer Reise in Niederländisch Ost-Indien, 1893, pl. viii. fig. 20.

which the vagina opens as a thick-walled tube; at the junction of the tube-like portion with the wider cavity, a very short receptacular duct opens, which leads into a large, somewhat pyriform-shaped receptaculum seminis (Pl. XLIV. figs. 8 & 11). The penis is short, though rather longer than that in *P. everetti*; the surface of its distal end is thrown into a series of ridges (Pl. XLIV. fig. 9 r): these are more conspicuous on the ventral side. The vas deferens passes off from the ventral side, as shown in fig. 9. The retractor muscle has its attachment much lower than in *P. everetti* (Pl. XLIV. figs. 3 & 8, *r.m.*), being below the vas deferens as in *P. pupillaris*, Humb. The common duct, consisting of the oviduct and prostate, is wound round upon itself and closely folded. There is a comparatively small albumen-gland. The hermaphrodite gland is a small oval-shaped body, attached to a densely convoluted tube, the hermaphrodite duct. The dart-sac is a large, thick muscular-walled organ, slightly twisted at its lower end. The dart (Pl. XLIV. fig. 10) is an irregular shaped body, solid throughout, non-calcareous, broad at its base and tapering at its free end.

#### *Affinities.*

The shape and size of the dart-sac and dart, the short receptacular duct, the position of the opening of the vas deferens into the penis, and the minor differences in the form of the penis and vagina, separate *P. intermedium* from any other known species of this genus. I am inclined to regard it, as I have hinted by its name, as an intermediate form connecting the genera *Parmarion* and *Microparmarion*. The receptacular duct is considerably shorter than that in *P. pupillaris*, Humb., figured and described by Simroth<sup>1</sup>. *P. pupillaris* is undoubtedly its nearest ally, but it differs from this species in the shorter length of the receptacular duct, the large and pyriform-shaped receptaculum seminis, the position which the duct opens into the vagina, the shape and size of the dart-sac and dart (*cf.* Simroth, *op. cit.* pl. viii. fig. 17), and the minor differences, such as the position which the vas deferens opens into the penis, the shape of this latter organ and the albumen-gland, &c.

The characters of these two genera are described by Simroth<sup>2</sup> as follows:—“*Parmarion* s.s.: Die Mantelkante springt stark vor. Die Schale ist eine zarte Kalkplatte, ähnlich wie bei *Limax*, mit einer kräftigen glänzenden Epidermis, die sich rechts und links über den Rand fortsetzt. Der Liebespfeil ist am Ende in schrägem Schlitz geöffnet. Der Penis ist gerade gestreckt, sein Lumen entspricht in der Form seinem äusseren Umfange. Receptaculum gestielt.

“*Microparmarion*: Die Mantelkante verwischt sich. Die dünne, von glänzender Epidermis überzogene Schalenplatte hat (z. T.)

<sup>1</sup> *Op. cit.* p. 106, pl. viii. fig. 16.

<sup>2</sup> *Op. cit.* p. 104.

